

***Pseudaparopion*, new genus of Curculionidae from southern Caspic region (Coleoptera, Curculionoidea, Molytinae)**

Roman BOROVEC¹, Giuseppe OSELLA² & Anna Maria ZUPPA²

¹ Husovo nám. 48, Nechanice, Czech Republic.

² Dipartimento di Scienze Ambientali, Università degli studi dell'Aquila, Via Vetoio, I-67100 L'Aquila, Italy.

***Pseudaparopion*, new genus of Curculionidae from southern Caspic region (Coleoptera, Curculionoidea, Molytinae).** - A new genus, *Pseudaparopion*, from southern Caspic region, is described. It includes two species: *P. aequale* (Reitter, 1883) from Lenkoran (Azerbajdzan) and *P. kadleci* sp. n. from Mazandaran (Iran). *P. aequale* was originally described by Reitter (1883) as *Aparopion aequale* but clearly does not belong in that genus on the basis of intervals not raised and structure of VIII sternite of female. A lectotype and paralectotype are here designated for *P. aequale*; this species is transferred from genus *Aparopion* as *Aparopion aequale*. Drawings of male and female genitalia for all species are provided. Taxonomic account and an identification key to the species are given.

Key-words: Curculionidae - Molytinae - *Pseudaparopion* - new genus - new species.

INTRODUCTION

Reitter (1883) described *Aparopion aequale* Reitter, 1883, from Lenkoran, differentiated from the other species of genus *Aparopion* Hampe, 1861, and in particular from *A. costatum* (Fåhræus, 1843) from Caucasus and southern Europe, by intervals on elytra not raised. The original description did not mention male and female genitalia. A second, more complete description (Reitter, 1886) followed the first one and a third contribution (Reitter, 1891), added a key to the three species of *Aparopion*: *A. costatum* (Fåhræus, 1843), *A. aequale* Reitter, 1883 and *A. suturidens* Reitter, 1891. No taxonomic accounts are available for genus *Aparopion* up to 1999, when Zuppa & Osella validated *A. chevrolati* Jacquelin du Val, 1868 (France and Italy) and described *A. numidicum* Zuppa & Osella, 1999 (Algeria). The authors excluded *A. aequale* from *Aparopion* because the intervals on elytra are not raised and structure of VIII sternite of female (only known sex). However, a new genus was not described as no male specimen was known at the time. One of the authors (RB), found among Curculionidae from Mazandaran (northern Iran) collected by Stanislav Kadlec, a Molytinae closely related to *A. aequale*, whose symmetric aedeagus strongly differed from the asymmetric aedeagus of *A. costatum*. It is thus possible to describe *Pseudaparopion* gen. n., which includes *P. aequale* (Reitter) and *P. kadleci* n. sp.

Specimens are deposited in the following collections:

- (HNHM) Hungarian Natural History Museum, Budapest, Hungary
- (MSNM) Museo Civico di Storia Naturale, Milano, Italy
- (MSNV) Museo Civico di Storia Naturale di Verona, Italy
- (MHNG) Muséum d'histoire naturelle, Genève, Switzerland
- (OS) Giuseppe Osella – Department of Environmental Science, University of L'Aquila, Italy
- (RB) Roman Borovec private collection
- (MM) Massimo Meregalli private collection

***Pseudaparopion* gen. n.**

Type species: *Aparopion aequale* Reitter, 1883.

Description. Body oval, rusty brownish, with short microscopic yellowish setae. Rostrum cylindrical, in lateral view a bit curved, a bit longer than pronotum, almost parallel-sided, weakly enlarged at apex. Dorsal surface densely punctured, ventral surface with three keels, the middle one narrower and smaller than the lateral ones. Scrobes, in dorsal view, only visible at apex, in lateral view with upper margin better developed than bottom one, very slightly curved, reaching lower border of eye. Eye small, weakly vaulted, elliptic. Head punctured, punctures as on rostrum, with a weak transversal depression between eyes. Antenna with slender scapus, in apical part widened, reaching anterior border of eye; funicle 7-jointed, slender, all segments longer than wide; club slender, with yellowish setae. Pronotum wider than long, a bit constricted behind anterior border, with arcuated sides without lateral lobes, densely punctured. Scutellum very small or invisible. Elytra oval, shoulder rounded, sides regularly arcuated, with 10 striae. Striae irregularly punctured, deeper than intervals with irregular row of small granules. Prosternum bow-shaped. Procoxae semi-globular, equidistant from anterior and posterior border of prosternum. Mesocoxae semi-globular, distance between them about 2/3 of diameter of mesocoxa. Mesepisternum and mesepimeron fused, without suture. Metepisternum invisible. Metasternum very wide and short, distance between mesocoxae and metacoxae shorter than diameter of mesocoxae. Metacoxae oval, transverse, distance between them about 2.5 times diameter of metacoxae. Ventrite 1 as long as ventrite 2; this longer than ventrites 3+4 and about the same length as ventrite 5. Suture between ventrites 3 and 4 deep, sutures of other ventrites shallow. The whole ventral sides of body densely and roughly punctured with rare, fine, short yellowish setae. Legs feebly robust. Trochanters small, triangular-shaped, femora untoothed. Tibiae curved on inner side, punctured, apex of anterior tibia with row of short yellowish setae and with one large, inside curved hook-shaped spine. Tarsi slender, article 3 wider than the others, bilobated, claws free.

Sexual dimorphism. Male with rostrum shorter and wider than female; in females ventrite 5 longer at apex, regularly arcuated.

Male genitalia symmetrical, well sclerotised; tegmen with short manubrium. Female genitalia with sternite VIII well sclerotised, with apical setae; spermatheca c-shaped.

Etymology. The name *Pseudaparopion* (Pseudo = false) refers to the similarity with *Aparopion*.

Distribution. *Pseudaparopion* seems to be endemic to coasts along Caspic sea, from Lenkoran in the north to montane and sub-montane areas in Damavand and Aladagh, northern Iran, in the south. It is replaced in Caucasus by *Aparopion*.

Ecology. No information is available for *P. aequale*. *P. kadleci* sp. n. was collected in superficial soil litter in broad-leaved forests, namely beech (*Fagus orientalis* Lipsky, 1898). *Pseudaparopion* seems to colonize the same habitat as *Aparopion*, although more researches are necessary for a complete knowledge of its ecology. Host plants for larva and adult are not known. Larva of *Aparopion* is xylophagous (Zuppa & Osella, 1999).

Pseudaparopion aequale (Reitter, 1883) comb. n.

Figs 1-2b

Aparopion aequale Reitter, 1883: 9.

Reitter, 1883: 9. Reitter, 1886: 231. Reitter, 1891: 249. Heyden *et al.*, 1891: 301. Heyden *et al.*, 1906: 652. Dalla Torre & Schenckling, 1932: 89. Winkler, 1932: 1572. Zuppa & Osella, 1999: 2.

Type Locality: Lenkoran (Azerbaijan).

Type Series. Lectotype female, dissected, here designated, labelled "Lenkoran, Leder (Reitter)/coll. Reitter/Holotypus 1884 *Aparopion aequale* Reitter" (HNHM). Paralectotype female, labelled "Lenkoran, Leder (Reitter)/coll. Reitter/Paratypus 1884 *Aparopion aequale* Reitter" (HNHM). Paralectotype female, labelled "Lenkoran, Leder (Reitter)/*Aparopion* n. sp. coll. Reitter" (HNHM). Paralectotype female, labelled "Caspic M. Gebiet, Leder (Reitter)/*Aparopion aequale* Reitt. coll. Jekel" (MSNM).

A lectotype is designated out of the syntypic series in order to fix unambiguously the status of this species.

Description. Body oval, light reddish, scarcely glossy, with short reclined golden setae on the whole body excluding rostrum and scape. Rostrum scarcely glossy, cylindrical at base, slightly widened at apex, weakly curved, barely longer than pronotum (female specimens), densely punctured; lacking distinct keels. Scrobes visible from above only in posterior part. Antenna with slender scape, weakly widened at apex. Funicle with all segments longer than wide, of moderately increasing largeness; club elliptical, first segment slightly glossy, longer than the two remaining; these last shortly setose. Eye elliptical, flat or weakly convex. Pronotum as typical of the genus. Scutellum invisible. Elytra elliptical, longer than wide, scarcely convex, shoulders rounded. Striae more impressed in basal third, scarcely impressed towards apex; first 5 with deep punctures, more distinct in basal third, shallow and scarcely distinct towards apex; intervals wider than striae, weakly raised in basal third, with small punctures and short setae. Legs weakly robust, punctured, with stiff gold setae at apex. Tarsus with segment 1 longer than wide; segment 2 triangular; segment 3 bilobate. Onychium strongly curved, with slender free claws.

Female genitalia. Sternum VIII with few apical setae, long, slender; arms broad, apically convergent, with outer margins almost parallel; fenestral area open, elongate, triangular. Apodemes broadly divergent, contiguous to base. Spermatheca with ramus distinct, extended slightly past insertion of spermathecal duct, set off from body by marked emargination; nodulus more or less slightly convex (Fig. 2b).

Measurements. Lectotype female. Total length without rostrum = 3.75 mm; rostral length from hind margin of the ocular dimple to apex = 1.16 mm; rostral width inclusive of scrobes = 0.31 mm; rostral width except scrobes = 0.25 mm; rostral width under scrobes = 0.28 mm; head

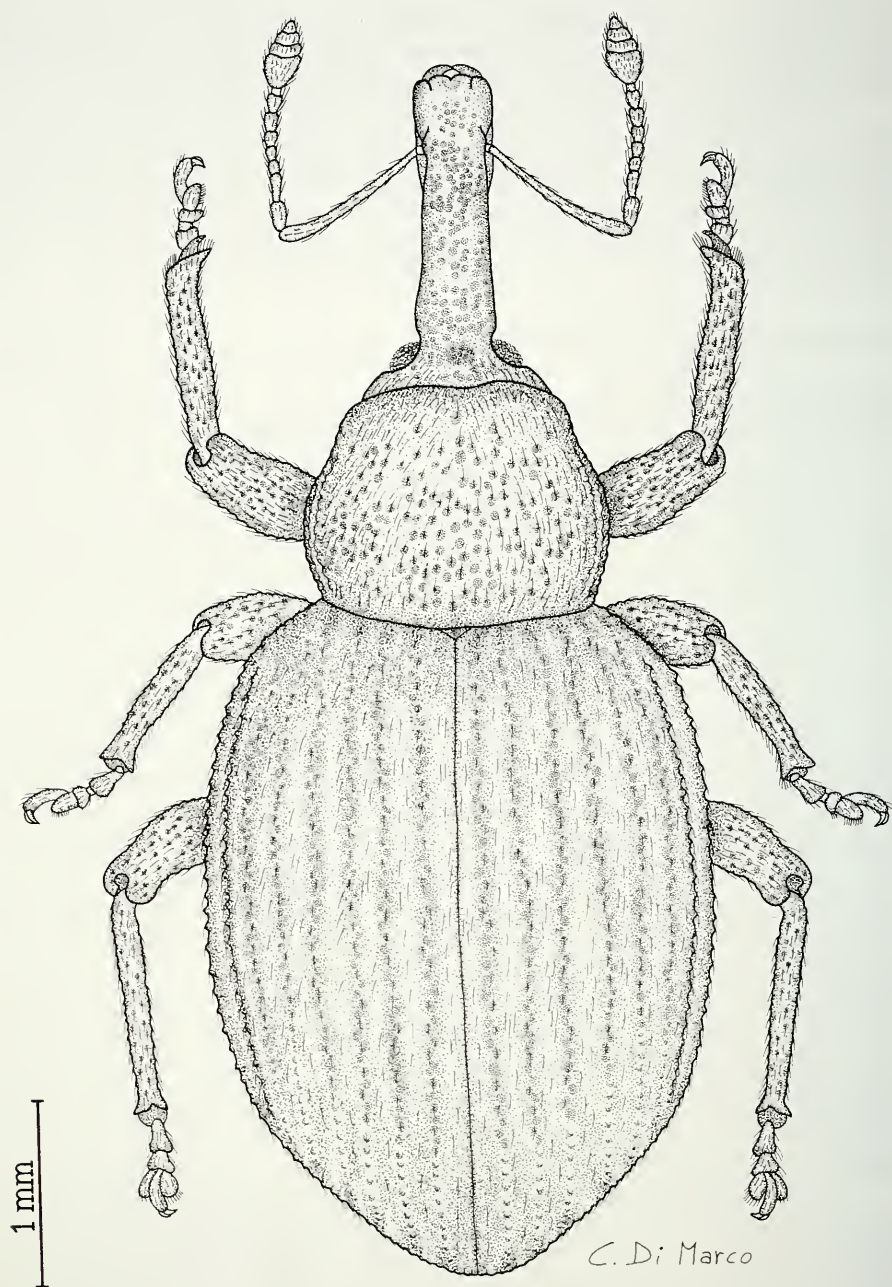


FIG. 1

Habitus of *Pseudaparopion aequale* (Reitter, 1883) (Lectotypus): Lenkoran (Azerbaijan).

width = 0.59 mm; scape length = 0.69 mm; funicular length = 0.59 mm; club length = 0.28 mm; funicular joint 1 length = 0.12 mm; joint 2 length = 0.14 mm; joint 3 length = 0.06 mm; joint 4 length = 0.06 mm; joint 5 length = 0.06 mm; joint 6 length = 0.06 mm; joint 7 length = 0.06 mm; interocular distance = 0.29 mm; pronotal length = 1.09 mm; pronotal maximum width = 1.31 mm; fore margin of pronotum width = 0.94 mm; elytral length = 2.62 mm; elytral maximum width = 2.03 mm; elytral base width = 1.31 mm.

Paralectotype female. Total length without rostrum = 3.25 ± 0.4 mm; rostral length from hind margin of the ocular dimple to apex = 1.03 ± 0.05 mm; rostral width inclusive of scrobes = 0.3 ± 0.02 mm; rostral width except scrobes = 0.23 ± 0.03 mm; rostral width under scrobes = 0.26 ± 0.02 mm; head width = 0.55 ± 0.03 mm; scape length = 0.65 ± 0.09 mm; funicular length = 0.57 ± 0.1 mm; club length = 0.22 ± 0.03 mm; funicular joint 1 length = 0.1 ± 0.01 mm; joint 2 length = 0.11 ± 0.006 mm; joint 3 length = 0.06 ± 0.006 mm; joint 4 length = 0.06 ± 0.006 mm; joint 5 length = 0.06 ± 0.006 mm; joint 6 length = 0.06 ± 0.006 mm; joint 7 length = 0.06 ± 0.006 mm; interocular distance = 0.29 ± 0.02 mm; pronotal length = 1.03 ± 0.16 mm; pronotal maximum width = 1.2 ± 0.05 mm; fore margin of pronotum width = 0.81 ± 0.06 mm; elytral length = 2.22 ± 0.27 mm; elytral maximum width = 1.91 ± 0.08 mm; elytral base width = 1.2 ± 0.05 mm.

Pseudaparopion kadleci sp. n.

Figs 2a-2c

Type Locality: Mazandaran (Iran).

Type Series. Holotype male: North Iran, Mazandaran, 10 Km S Calús, 36°34'N, 51°22'E, 250-400 m, 21-23.vi.2000, lgt. S. Kadlec (MSNV). Paratypes: 4 males (1 ♂ MHNG, 1 ♂ MM, 1 ♂ RB), 2 females (1 ♀ OS, 1 ♀ RB).

Description. Body oval, rusty brownish, tarsus and antenna lighter. Whole body excluding rostrum and scapus with short, reclined yellowish setae. Rostrum robust, glossy, cylindrical, in lateral view a bit curved, in both sexes slightly longer than pronotum. Rostrum in basal half anteriorly tapered, widened towards apical half anteriorly enlarged. Eye oval, feebly convex. Antennae with scapus slender, only in apical part enlarged. 1 segment of funicle longer than wide, a bit wider and shorter than the second one, that is longer than wide. Segments 3-6 wider than long, segment 7 longer than wide. Club about as long as last three funicle segments, slender, pointed. Pronotum wider than long, characters as in genus description. Elytra longer than wide. Scutellum inconspicuous. Every interval brings two irregular rows of yellowish setae, placed on small granules. The same setae placed in each puncture of striae. Femurs un-toothed. Tibiae double curved in inner side, apex of tibia with row of short, yellowish setae. Tarsi slender; segment 1 longer than wide, conical; segment 2 wider than long; segment 3 strongly bilobated, much wider than the others. Onychium longer than segment 3. Claws free.

Male genitalia. Median lobe with dorsal surface, excluding orificial area, sclerotized; ventral surface sclerotized, parallel-side; extreme apex elongate, slightly rounded, curved outside, in lateral view curved; dorsobasal margin distinct, deeply emarginate. Apodemes as long as median lobe. Tegmen without parameres (Fig. 2a). Female genitalia as in *A. aequale* except fenestral area open, short, subelliptical (Fig. 2c).

Measurements. Holotype male. Total length without rostrum = 4.16 mm; rostral length from hind margin of the ocular dimple to apex = 1.16 mm; rostral width inclusive of scrobes = 0.5 mm; rostral width except scrobes = 0.28 mm; rostral width under scrobes = 0.31 mm; head width = 0.62 mm; scape length = 0.84 mm; funicular length = 0.69 mm; club length = 0.34 mm; funicular joint 1 length = 0.12 mm; joint 2 length = 0.16 mm; joint 3 length = 0.06 mm; joint 4

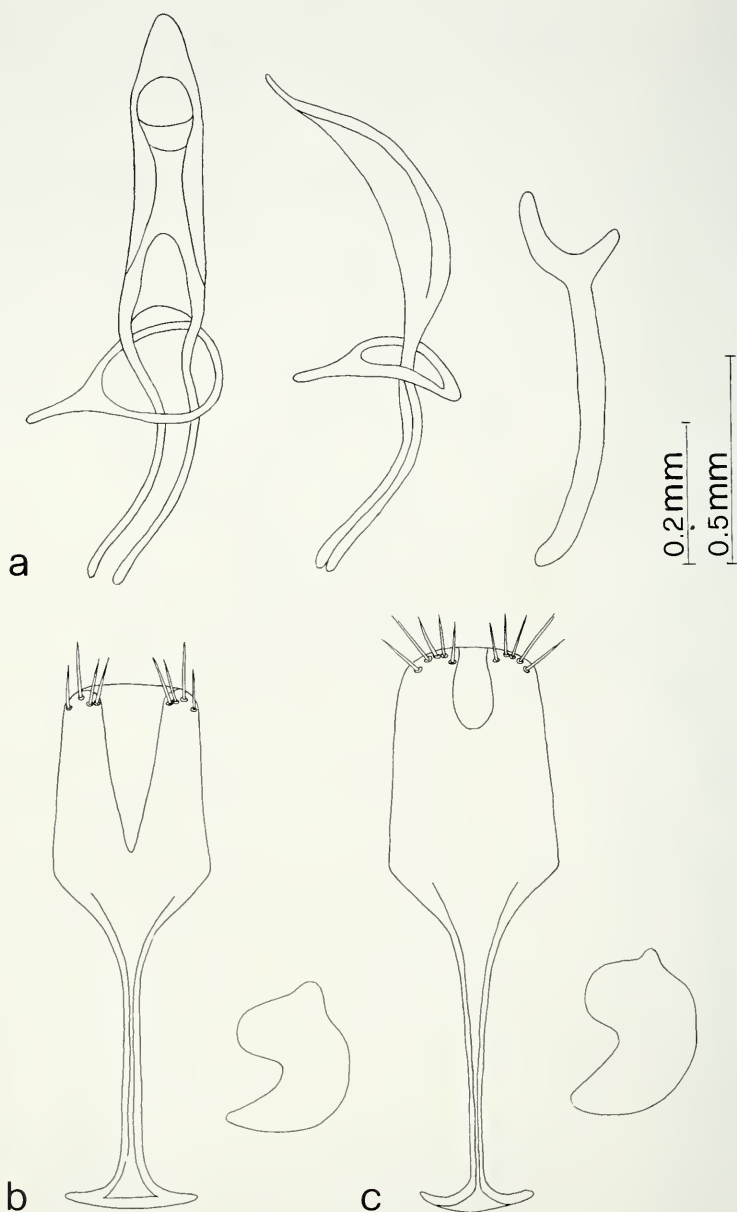


FIG. 2

Aedeagus (dorsal and lateral view) and spiculum gastrale of *Pseudaparopion kadleci* sp. n. (Holotypus): North Iran, Mazandaran (a) (scale line 0.5 mm); spiculum ventrale (scale line 0.2 mm) and spermatheca (scale line 0.5 mm) of *Pseudaparopion aequale* (Reitter, 1883) (Lectotypus): Lenkoran (Azerbaijan) (b) and *Pseudaparopion kadleci* sp. n. (Paratypus): North Iran, Mazandaran (c).

length = 0.06 mm; joint 5 length = 0.06 mm; joint 6 length = 0.06 mm; joint 7 length = 0.06 mm; interocular distance = 0.31 mm; pronotal length = 1.12 mm; pronotal maximum width = 1.41 mm; fore margin of pronotum width = 0.97 mm; elytral length = 3.03 mm; elytral maximum width = 2.25 mm; elytral base width = 1.41 mm.

Paratype male. Total length without rostrum = 3.58 ± 0.43 mm; rostral length from hind margin of the ocular dimple to apex = 1 ± 0.05 mm; rostral width inclusive of scrobes = 0.39 ± 0.04 mm; rostral width except scrobes = 0.24 ± 0.03 mm; rostral width under scrobes = 0.30 ± 0.03 mm; head width = 0.60 ± 0.08 mm; scape length = 0.82 ± 0.07 mm; funicular length = 0.64 ± 0.07 mm; club length = 0.30 ± 0.03 mm; funicular joint 1 length = 0.09 mm; joint 2 length = 0.12 mm; joint 3 length = 0.06 mm; joint 4 length = 0.06 mm; joint 5 length = 0.06 mm; joint 6 length = 0.06 mm; joint 7 length = 0.06 mm; interocular distance = 0.30 ± 0.03 mm; pronotal length = 1.01 ± 0.13 mm; pronotal maximum width = 0.98 ± 0.49 mm; fore margin of pronotum width = 0.86 ± 0.1 mm; elytral length = 2.56 ± 0.3 mm; elytral maximum width = 2.03 ± 0.23 mm; elytral base width = 1.28 ± 0.11 mm.

Paratype female. Total length without rostrum = 3.95 ± 0.16 mm; rostral length from hind margin of the ocular dimple to apex = 0.67 ± 0.69 mm; rostral width inclusive of scrobes = 0.34 mm; rostral width except scrobes = 0.22 mm; rostral width under scrobes = 0.28 mm; head width = 0.5 ± 0.31 mm; scape length = 0.8 ± 0.02 mm; funicular length = 0.64 ± 0.03 mm; club length = 0.28 mm; funicular joint 1 length = 0.11 ± 0.02 mm; joint 2 length = 0.14 ± 0.03 mm; joint 3 length = 0.06 mm; joint 4 length = 0.06 mm; joint 5 length = 0.06 mm; joint 6 length = 0.06 mm; joint 7 length = 0.06 mm; interocular distance = 0.32 ± 0.02 mm; pronotal length = 1.03 ± 0.06 mm; pronotal maximum width = 1.28 ± 0.18 mm; fore margin of pronotum width = 0.83 ± 0.11 mm; elytral length = 2.66 ± 0.09 mm; elytral maximum width = 2.25 ± 0.08 mm; elytral base width = 1.39 ± 0.07 mm.

Etymology. The new species is named after Stanislav Kadlec who collected all known specimens.

Taxonomic account. Suprageneric systematics in Molytinae is far from being understood regardless to the numerous attempts (Zherichin, 1987; Kuschel, 1987). A precise classification is made complex by the large number of known taxa (about 1400 up to 1978, according to O'Brien & Wibmer, 1978), differences in descriptions, difficulty of finding materials for a complete revision, scarce level of faunistic knowledge, particularly in the case of extra-palaearctic faunas.

Aparopion Hampe, 1861 has always been included in Curculioninae (at present Molytinae = Hylobiinae) (Bedel, 1888; Reitter, 1912; Reitter, 1916). Within this subfamily, *Aparopion* was ascribed to Plinthini, Curculionini or Anchonini and, at subtribal rank, to Plinthina, Leiosomatina, Cycloterina or, as recently proposed (Alonso-Zarazaga & Lyal, 1999), Typoderina. This last subtribe was described by Voss (1965) for *Typoderus* Marshall, 1953 (Angola). Zherichin (1987) recognized an "*Anchonidium*-group" for some Himalayan Molytinae. The author suggested that this informal group, to be named Typoderina, includes *Anchonidium* Bedel, 1884, *Pseudoanchonidium* Osella, 1979, *Aparopion* Hampe, 1861, *Caulomorphus* Faust, 1886, *Echinomorphus* Fauvel, 1889, *Microcopes* Faust, 1886, *Orinanchonus* Voss, 1965, *Aparopionella* Hustache, 1939, *Typoderus* Marshall, 1953 and *Microplinthus* Zherichin, 1987. However, Zherichin did not formalize the proposal. Alonso-Zarazaga & Lyal (1999) accepted Zherichin's opinion, without any critical justification, and added several genera to Typoderina: *Neoanchonidium* Hoffmann, 1968, *Subanchonidium* Hoffmann, 1968, *Cotasteridius* Péringuey, 1908, *Merunymus* Hoffmann, 1965, *Miopus* Marshall, 1949, *Niphadomimus* Zherichin, 1987, *Oromia* Alonso-Zarazaga, 1987, *Pentaparopion* Morimoto, 1982, *Plessinellus* Hoffmann, 1964, *Styphloderes*

Wollaston, 1873, *Entypoderus* Voss, 1965. *Caulomorphus* Faust, 1886 was transferred to Plinthina; *Echinomorphus* Fauvel, 1889 and *Microcopes* Hustache, 1930 to Cossoninae Dryotribini. Typoderina sensu Alonso-Zarazaga & Lyal (1999) appears to be a rather heterogeneous group. M. Meregalli (Torino, personal communication), who is presently revising some Himalayan genera of Molytinae, confirms relationships between Himalaya and Central Africa for some genera of Molytinae, as is the case of *Niphades* Pascoe, 1871. However, he notes that sternite VIII of females differs between *Typoderus* and other palaearctic genera ascribed to the tribe. The attribution of *Aparopion* to Cycloterina, suggested by Solari (1941), Marshall (1932) and Alonso-Zarazaga (1987) does not seem acceptable for morphological and biogeographical considerations: *Cycloterus* Schönherr, 1843 is a genus with 97 known species from Madagascar and Comores Islands (Richard, 1981); the subtribe is mainly tropical afro-american (Alonso-Zarazaga & Lyal, 1999). Thus, inclusion of *Pseudaparonion* gen. n. in Typoderina only basing on its presumed affinity with *Aparopion* is only hypothetical. For the present time, we ascribe *Pseudaparonion* to the "*Anchondium* group" sensu Zherichin (1987).

KEY TO SPECIES OF *PSEUDAPAROPION* GEN. N.

- 1 Size smaller (3.25 mm). Scutellum invisible. Intervals wider than striae, with small punctures and short setae. Tarsus with segment 2 as wide as long and segment 3 bilobate. Lenkoran (Azerbajdzan) . . . *P. aequale* (Reitter)
- Size larger (3.95 mm). Scutellum very small. Intervals as wide as striae, with small granules and two rows of setae. Tarsus with segment 2 wider than long; segment 3 strongly bilobate. Mazandaran (Iran) . . . *P. kadleci* sp. n.

ACKNOWLEDGEMENTS

We thank Stanislav Kadlec who collected all specimens of *Pseudaparonion kadleci* and our friend Massimo Meregalli for taxonomic comments.

REFERENCES

- ALONSO-ZARAZAGA, M. A. 1987. *Oromia hephaestos* n. gen., n. sp. de edafobio ciego de las Islas Canarias (Col., Curculionidae, Molytinae). *Vieraea* 17: 105-115.
- ALONSO-ZARAZAGA, M. A. & LYAL, C. H. C. 1999. A World Catalogue of Families and Genera of Curculionoidea (Insecta: Coleoptera) (Excepting Scolytidae and Platypodidae). *Entomopraxis*, 315 pp.
- BEDEL, L. 1888. Faune de Coléoptères du Bassin de la Seine. *Annales de la Société entomologique de France* 6 : 442 pp.
- DALLA TORRE, K. W. VON, SCHENKLING, S. & MARSHALL, G. A. K. 1932. Coleopterorum Catalogus, auspiciis et auxilio W. Junk editus a S. Schenkling, pars 122-123. Curculionidae: Hylotiinae, Curculioninae. *W. Junk, Berlin*: 1-112.
- HEYDEN, L. VON, REITTER, E. & WEISE, J. 1891. Catalogus Coleopterorum Europae, Caucasi et Armeniae rossicae. Curculionidae. *Ed. Reitter*: 270-330.
- HEYDEN, L. VON, REITTER, E. & WEISE, J. 1906. Catalogus Coleopterorum Europae, Caucasi et Armeniae rossicae. Curculionidae. *Ed. Reitter*: 593-707.
- KUSCHEL, G. 1987. The subfamily Molytinae (Coleoptera: Curculionidae): General notes and descriptions of new taxa from New Zealand and Chile. *New Zealand Entomology* 9: 1-117.

- MARSHALL, G. 1932. Notes on the Hylobiinae (Col., Curc.). *Annals and Magazine of Natural History* 9 (10): 341-355.
- O'BRIEN, C. W. & WIBMER, G. J. 1978. Numbers of Genera and Species of Curculionidae (Coleoptera). *Entomological News* 89 (2/3): 89-92.
- REITTER, E. 1883 (1884). Diagnosen neuer Coleopteren aus Lenkoran. *Verhandlungen des Naturwissenschaftlichen Vereins Brünn* 22: 3-10.
- REITTER, E. 1886. Arthrozoa, Coleoptera. In: RADDE. Die Fauna und Flora des südwestlichen Caspi-Gebiets. *Wissenschaftliche Beiträge zu den Reisen an der Persisch-Russischen Grenze*: 230-232 (Curculionidae).
- REITTER, E. 1891. Erster Beiträge zur Coleopteren-Fauna von Europa und den angrenzenden Ländern. *Wiener Entomologische Zeitung* 10: 246-249.
- REITTER, E. 1912. Bestimmungs-Tabellen der europäischen Coleopteren. LXVIII. Bestimmungs-Schlüssel für die Unterfamilien, Tribus und Gattungen der Curculionidae. *Verhandlungen des Naturwissenschaftlichen Vereins Brünn*: 1- 87.
- REITTER, E. 1916. Fauna Germanica. Die Käfer des Deutschen Reiches. K. G. Lutz' Verlag, Stuttgart: 168 pp.
- RICHARD, R. 1981. Insectes Coléoptères Curculionidae Cycloterini. 55. Faune de Madagascar. Publiée sous les auspices du Gouvernement de la République Malgache. *Imprimerie Nouvelle, Paris*: 5-104.
- SOLARI, F. 1941. Revisione dei *Neopliintlus* italiani ed alcune note di sistematica generale dei Curculionidi (Coleoptera). *Memorie della Società Entomologica Italiana* 20: 43-90.
- WINKLER, A. 1932. Catalogus Coleopterorum regionis palaearcticae. Rhynchophora: Curculionidae. *Ed. Winkler* 2: 1370-1631.
- VOSS, E. 1965. Mission zoologique de l'I.R.S.A.C. en Afrique orientale (P. Basilewsky et N. Leleup, 1957). XCVII. Coleoptera Curculionidae II. *Annales du Musée royal de L'Afrique Centrale. Serie 8. Sciences zoologiques* 138: 293-377.
- ZHERICHIN, V. V. 1987. Curculionidae from the Nepal Himalayas. Part I. Molytinae (Insecta: Coleoptera). *Stuttgarter Beiträge zur Naturkunde (Serie A) (Biologie)* 411 (43): 1-43.
- ZUPPA, A. M. & OSELLA, G. 1999. Revisione del genere *Aparopion* Hampe, 1861 (Coleoptera, Curculionidae, Molytinae). *Bollettino del Museo civico di Storia naturale di Verona* 23: 1-48.